

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): Method for producing a ~~workpiece~~ or a plate of steel which is resistant to abrasion and whose chemical composition comprises, by weight:

$0.24\% \leq C < 0.35\%$

$0\% \leq Si \leq 2\%$

$0\% \leq Al \leq 2\%$

$0.5\% \leq Si + Al \leq 2\%$

$0\% \leq Mn \leq 2.5\%$

$0\% \leq Ni \leq 5\%$

$0\% \leq Cr \leq 5\%$

$0\% \leq Mo \leq 1\%$

$0\% \leq W \leq 2\%$

$0.1\% \leq Mo + W/2 \leq 1\%$

$0\% \leq B \leq 0.02\%$

$0\% \leq Ti \leq 1.1\%$

$0\% \leq Zr \leq 2.2\%$

$0.35\% \leq 0.5\% < Ti + Zr/2 \leq 1.1\%$

$0\% \leq S \leq 0.15\%$

$N < 0.03\%$

- optionally from 0% up to 1.5% of copper,

- optionally at least one element selected from Nb, Ta and V at contents such that $Nb/2 + Ta/4 + V \leq 0.5\%$,

- optionally at least one element selected from Se, Te, Ca, Bi, Pb at contents which are less than or equal to 0.1%,

the balance being iron and impurities resulting from the production operation, the chemical composition further complying with the following relationships:

$$C^* = C - Ti/4 - Zr/8 + 7xN/8 \geq 0.095\%$$

and:

$$1.05xMn + 0.54xNi + 0.50xCr + 0.3x(Mo + W/2)^{1/2} + K > 1.8$$

with: $K = 0.5$ if $B \geq 0.0005\%$ and $K = 0$ if $B < 0.0005\%$.

according to which the plate is subjected to a thermal quenching processing operation which is carried out in the heat for ~~forming~~ ~~rolling~~ in the hot state and, for example, ~~rolling~~ ~~heat~~, or after austenitization by reheating in a furnace, in order to carry out the quenching:

- the ~~workpiece~~ or the plate is cooled at a mean cooling rate greater than $0.5^{\circ}C/s$ between a temperature greater than AC_3 and a temperature of from approximately $T = 800 - 270xC^* - 90xMn - 37xNi - 70xCr - 70xCr - 83x(Mo + W/2)$, to $T-50^{\circ}C$,

- the ~~workpiece~~ or the plate is then cooled at a mean core cooling rate $V_r < 1150xep^{-1.7}$ and greater than $0.1^{\circ}C/s$ between the temperature T and $100^{\circ}C$, ep being the thickness of the plate expressed in mm,

- the ~~workpiece~~ or the plate is cooled as far as ambient temperature and optionally planishing is carried out.

2. (currently amended): Method according to claim 1, ~~characterized in that~~ ~~wherein~~:

$$1.05xMn + 0.54xNi + 0.50xCr + 0.3x(Mo + W/2)^{1/2} + K > 2.$$

3. (canceled).

4. (currently amended): Method according to ~~any one of claims 1 to 3~~claim 1,
characterized in thatwherein:

$$C^* \geq 0.12\%.$$

5. (currently amended): Method according to ~~any one of claims 1 to 4~~claim 1,
characterized in thatwherein:

$$Si + Al \geq 0.7\%.$$

6. (currently amended): Method according to ~~any one of claims 1 to 5~~claim 1,
characterized in thatwherein tempering is further carried out at a temperature which is less
than or equal to 350°C.

7. (currently amended): Method according to ~~any one of claims 1 to 6~~claim 1,
characterized in thatwherein, the chemical composition of the steel is obtained by a melting
process during which or after in order to add titanium to the steel, the liquidthe steel is placed
in contact with a slag containing titanium and the titanium of the slag is caused to diffuse
slowly in the liquid steel which is in a liquid state.

8. (withdrawn): Workpiece, and in particular a plate, of steel which is resistant to
abrasion and whose chemical composition comprises, by weight:

$$0.24\% \leq C < 0.35\%$$

$0\% \leq \text{Si} \leq 2\%$

$0\% \leq \text{Al} \leq 2\%$

$0.5\% \leq \text{Si} + \text{Al} \leq 2\%$

$0\% \leq \text{Mn} \leq 2.5\%$

$0\% \leq \text{Ni} \leq 5\%$

$0\% \leq \text{Cr} \leq 5\%$

$0\% \leq \text{Mo} \leq 1\%$

$0\% \leq \text{W} \leq 2\%$

$0.1\% \leq \text{Mo} + \text{W}/2 \leq 1\%$

$0\% \leq \text{B} \leq 0.02\%$

$0\% \leq \text{Ti} \leq 1.1\%$

$0\% \leq \text{Zr} \leq 2.2\%$

$0.35\% < \text{Ti} + \text{Zr}/2 \leq 1.1\%$

$0\% \leq \text{S} \leq 0.15\%$

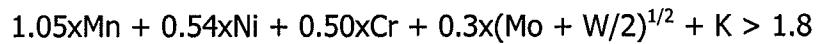
$\text{N} < 0.03\%$

- optionally from 0% to 1.5% of copper,
- optionally at least one element selected from Nb, Ta and V at contents such that $\text{Nb}/2 + \text{Ta}/4 + \text{V} \leq 0.5\%$,
- optionally at least one element selected from Se, Te, Ca, Bi, Pb at contents which are less than or equal to 0.1%,

the balance being iron and impurities resulting from the production operation, the chemical composition further complying with the following relationships:

$$\text{C} - \text{Ti}/4 - \text{Zr}/8 + 7\text{xN}/8 \geq 0.095\%$$

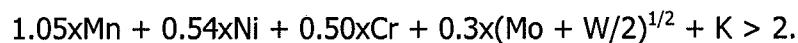
and:



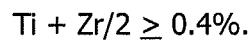
with: $\text{K} = 0.5$ if $\text{B} \geq 0.0005\%$ and $\text{K} = 0$ if $\text{B} < 0.0005\%$,

the steel having a martensitic or martensitic/bainitic structure, the structure containing from 5% to 20% of retained austenite and carbides.

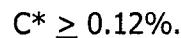
9. (withdrawn): Workpiece according to claim 8, characterized in that:



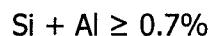
10. (withdrawn): Workpiece according to claim 8 or claim 9, characterized in that:



11. (withdrawn): Workpiece according to any one of claims 8 to 10, characterized in that:



12. (withdrawn): Workpiece according to any one of claims 8 to 11, characterized in that:



13. (withdrawn): Workpiece according to any one of claims 8 to 12, characterized in that it is a plate having a thickness of from 2 mm to 150 mm.